MATH-131 TEST 2 Unit 2
SAMPLE 2014

NAME:_____

Show work. No calculators. If you finish early, *take time to check.*

CIRCLE T FOR TRUE, F FOR FALSE.

T F (1) The domain of the function f(x)= $\frac{2x+3}{5-x}$ is $(5,\infty)$

T F (2) The expression $(x+1)(x-1)(4x^3 - 7x^2 - 6x + 1)$ is factored.

T F (3) $3x^{-2}$ simplifies to $\frac{1}{3x^2}$

T F (4) $4x^3 + \frac{1}{x}$ is a polynomial

T F (5) $(x + y)^3 = x^3 + y^3$

Fill in the blank with the most appropriate answer.

(6) Add: $(x^2y^3 + 7x^4y^5) + (5x^4y^5 - 11x^2y^3 + 3x^3)$ _____

(7) Factor ½ out of the following expression: $\frac{1}{2}x + 4$ _____

(8) The degree of the polynomial $3x^4 - 4x^3 + x^2 - 4$ is _____

(9) Simplify $\frac{\frac{2x^3}{5}}{\frac{10x^5}{7}}$ _____

(10) Given the functions $f(x) = 2x^2 + 3x$ $g(x) = 3x + 1$ $h(x) = x^4$, find and simplify the following:

(a) $f(-2)$ = _____ (b) $(gh)(x)$ = _____

(c) $\left(\frac{g}{f}\right)(3)$ = _____ (d) $(g - h)(x)$ = _____

(11) Simplify Do not leave any negative exponents in your answers. Work carefully on these, no partial credit.

(a) $\frac{21x^6y^{-8}}{14x^{-2}y^{-1}}$ (b) $\left(3w^4z\right)\left(8w^7z^{-5}\right)$ (c) $\left(-5x^4b^{-5}\right)^2$

(12) Multiply (a) $\frac{1}{2}x^3(4x+3)^2$ (b) $\left(3a - 2b^5\right)\left(3a + 2b^5\right)$

FACTOR EACH OF THE FOLLOWING POLYNOMIALS COMPLETELY.

(13) $x^3 + 5x^2 - 8x - 40$

also problems like $2x^{-\frac{1}{2}} - 6x^{\frac{3}{2}}$

(14) $3x^4(2x+1)^2 - 15x^2(2x+1)^3$

(15) $y^4 - 16$

(16) $8x^2y^7 - 4x^2y^3 - 32x^3y^3$

(17) $x^2 + 4x + 4 - 4z^2$

(18) $8x^3 - 27$

(19) $6x^2 - 17x - 45$

(20) $10a^2 + 102a + 20$

(21) DIVIDE: $(2x^3 - 5x^2 - 10x - 6) / (x - 4)$

(22) Simplify. Do not leave any negative exponents in your answer.

a) $\left(-3w^5z^3\right)^2\left(-w^7z^{-5}\right)^3$ = _____

b) $\left(\frac{15a^8b^{-7}c^5}{45a^{-2}b^{-5}c^{-3}}\right)^{-2}$ = _____

(23) Reduce each of the following

(a) $\dfrac{y^2-6y+5}{-2y^2+50}$

(b) $\dfrac{a^3+27}{4a^2+17a+15}$

(24) Simplify. Reduce answers:

(a) $\dfrac{x-5}{x^2-16}-\dfrac{x-2}{x^2+2x-8}$

(b) $\dfrac{1}{16a^6b^5}+\dfrac{3}{4a^3b^2}$

(c) $\dfrac{\dfrac{9}{x^2}-\dfrac{3}{x}}{\dfrac{3}{x}-3}$

(d) $4-\dfrac{y+2}{y-1}$

(e) $\dfrac{3x^2-x}{x+7}\bullet\dfrac{2x^2+19x+35}{5x^4+3x^3}\div\dfrac{6x^2+13x-5}{5x+3}$

Answers: 1) F, 2)T, 3)F, 4)F, 5)F 6) $-10x^2y^3+12x^4y^5+3x^3$ 7) $\frac{1}{2}(x+8)$ 8) 4 9) $\frac{7}{25x^2}$

10) a) 2 b) $3x^5+x^4$ c) 10/27 d) $3x+1-x^4$ 11) a) $\frac{3x^8}{2y^7}$ b) $\frac{24w^{11}}{z^4}$ c) $\frac{25x^8}{b^{10}}$

12) a) $8x^5+12x^4+\frac{9}{2}x^3$ b) $9a^2-4b^{10}$ 13) $(x^2-8)(x+5)$ 14) $3x^2(2x+1)^2(x^2-10x-5)$

15) $(y-2)(y+2)(y^2+4)$ (16) $4x^2y^3(2y^4-1-8x)$ (17) $(x+2-2z)(x+2+2z)$ 18) $(2x-3)(4x^2+6x+9)$

19) $(2x-9)(3x+5)$ 20) $2(5a+1)(a+10)$ 21) $2x^2+3x+2+\frac{2}{x-4}$ 22) a) $\frac{-9w^{31}}{z^9}$ b) $\frac{9b^4}{a^{20}c^{16}}$

23) a) $\frac{y-1}{-2(y+5)}$ b) $\frac{a^2+3a+9}{4a+5}$ 24) a) $\frac{-1}{(x-4)(x+4)}$ b) $\frac{1+12a^3b^3}{16a^6b^5}$ c) $\frac{3-x}{x-x^2}$ d) $\frac{3y-6}{y-1}$

e) $\frac{1}{x^2}$